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10/815,280	03/30/2004	Lalit Sarna	930114.420	8342

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EXAMINER	
HUNG, YUBIN	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/815,280	SARNA, LALIT	
	Examiner	Art Unit	
	Yubin Hung	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-43* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8,11-16,18-30,32-36 and 38-43* is/are rejected.

7)☒ Claim(s) *9,10,17,31 and 37* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *03/28/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 101

1. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

In addition, the USPTO "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility" (Official Gazette notice of 22 November 2005), ANNEX IV, partly reads as follows:

First paragraph

> Descriptive material can be characterized as either "functional descriptive material" or "nonfunctional descriptive material." In this context, "functional descriptive material" consists of data structure and computer programs which impart functionality when employed as a computer component. ...

Second paragraph

> Both types of "descriptive material" are nonstatutory when claimed as descriptive material per se. ...

Section (a), second paragraph, beginning at line 7

> In contrast, a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory. See Lowery, 32 F.3d at 1583-84, 32 USPQ2d at 1035. ...

2. Claims 22-27 are rejected under 35 U.S.C. 101 because the claimed inventions are directed to non-statutory subject matter as follows. Claims 22-27 recite a *machine-*

readable medium having *instructions* stored thereon. Since the machine-readable medium and the instructions are not necessarily computer-readable, the inventions of claims 22-27 are not statutory subject matter. [Note: it is recommended that applicant replace "machine-readable" with "computer-readable," "instructions" with "computer-executable instructions" and "processor" with "computer" to overcome the above rejection.]

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-3, 5, 7, 8, 11, 13, 15, 16, 18-22, 24-30, 32, 34-36, 40, 41 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gonzales et al. (US 5,231,484), and further in view of Simon et al. (US 7,184,578) and Park et al. (US 6,353,632).

5. Regarding claim 1, Gonzales discloses

- adaptively filtering at least some high frequency components from video frame
  [Fig. 6, ref. 3; Col. 10, lines 19-41 (QP-adaptive filtering); Col. 22, lines 45-66 (note that high-frequency information is attenuated)]
- encoding these filtered video frames

[Fig. 6, ref. 1; Col. 10, lines 41-53]

- dynamically adapting a property of either or both of the filterings based on a set of criteria, including feedback information from the encoding
  [Fig. 6, refs 1 & 3 (with feedback QP_{prev}, a criterion0); Figs. 15 & 16; Col. 23, line 28-Col. 24, line 11. Note that Col. 23, lines 50-67 show that the adapted property is the strength (reflected in coefficient values) of filtering]

In addition, Simon discloses filtering texture information within object boundaries in an image [Fig. 2E, refs. 2110-2130 (face being the object); Fig. 6A, ref. 610; Col. 10, lines 49-67; Col. 13, lines 44-50 (texture-filtering the face); Col. 15, lines 31-34 (smoothing as texture filtering); also Figs. 7 & 8 and Col. 15, line 30-Col. 24, line 55 for detailed discussion of texture filtering].

Furthermore, Park discloses adaptively filtering image data [Fig. 2, refs. 28 & 41; Fig. 6 (adaptive filter kernels); Col. 7, line 50-Col. 8, line 64].

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Gonzales with the teachings of Simon and Park by adaptively filtering texture information as recited to obtain the invention as specified in claim 1. The reasons for doing so would have been to smooth the object (face in this case) texture and to remove noise (including blemishes and dark spots) as Simon indicates in column 15, lines 31-34, as well as to reduce the magnitude of the noise and the nonuniformity of the noise variance as Park indicates in Col. 1, line 62-Col. 2, line 6.

6. Regarding claims 2 and 3, Park further discloses adapting a region of support (claim 2) and adapting strength of filtering (claim 3) [Fig. 6 (different regions of support);Col. 8, lines 52-64 (varying the filter coefficients, i.e., adapting the filtering strength)].

7. Regarding claim 5, Gonzales discloses dynamically adapting the filtering strength based on quantization level fed back from the encoder [Fig. 6; col. 23, lines 28-67].

8. Regarding claim 7, Gonzales discloses low-pass filtering of high-frequency components [Col. 22, lines 45-53].

9. Regarding claim 8, Gonzales further discloses the use of a non-linear filter [Col. 22, lines 60-66]. Since texture typically comprises high-frequency content (for example, see Simon: Col. 23, lines 53-55), it would therefore have been obvious to one of ordinary skill in the art to apply non-linear filtering to texture to achieve the good trade-off as Gonzales indicated in Col. 22, lines 60-66.

10. Regarding claim 11, Gonzales further discloses additional processing prior to encoding [Fig. 11, refs. 14 (motion estimation, the additional processing) and 16 (encoding)].

11. Regarding claim 13, and similarly claims 22 and 32, per the analysis of claim 1 the combined invention of Gonzales, Simon and Park further discloses (note that Simon's texture enhancement filtering includes smoothing)

- filtering high frequency information from at least some video frames having abrupt image changes [Per the analysis of claim 1. Note that Gonzalez high-frequency filters all frames, including those having abrupt image changes]
- smoothing texture information within object boundaries of an image in the video frames
- adaptively changing, if necessary, a characteristic of either one or both of the filtering and smoothing in response to a set of criteria

12. Claim 15, and similarly claim 24, is similarly analyzed as per claim 5 (and parent claim 13).

13. Claim 16, and similarly claim 25, is similarly analyzed as per claim 2 (and parent claim 13).

14. Claim 18 is similarly analyzed as per claim 4 (and parent claim 13).

15. Claim 19 is similarly analyzed as per claim 6 (and parent claim 13).

16. Claim 20 is similarly analyzed and rejected as per the analyses of claims 1 and 11 (and parent claim 13).

17. Claim 21 is similarly analyzed and rejected as per the analysis of claim 1 (and parent claim 13).

18. Claim 26 is similarly analyzed and rejected as per the analyses of claims 17-19 (and parent claim 22).

19. Claim 27 is similarly analyzed and rejected as per the analyses of claims 20 and 21 (and parent claim 22).

20. Claim 28 is similarly analyzed and rejected as per the analysis of claim 1.

21. Claim 29 is similarly analyzed and rejected as per the analyses of claims 2-3 (and parent claim 28).

22. Claim 30 is similarly analyzed and rejected as per the analysis of claim 1 (and parent claim 28).

23. Claim 34 is similarly analyzed and rejected as per the analyses of claims 7-8 (and parent claim 32).

24. Claim 35, and similarly claim 36, is similarly analyzed and rejected as per the analysis of claim 2 (and parent claim 32), along with official notice that programmability is well-known and widely used in the art to provide flexibility.

25. Claim 40 is similarly analyzed and rejected as per the analysis of claim 5 (and parent claim 32).

26. Claim 41 is similarly analyzed and rejected as per the analysis of claim 6 (and parent claim 40).

27. Claim 43 is similarly analyzed and rejected as per the analysis of claim 1, especially regarding texture filtering (and parent claim 32).

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28. Claims 4 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gonzales et al. (US 5,231,484), Simon et al. (US 7,184,578) and Park et al. (US 6,353,632) as applied to claims 1-3, 5, 7, 8, 11, 13, 15, 16, 18-22, 24-30, 32, 34-36, 40, 41 and 43 above, and further in view of Lee et al. (US 2002/0186890).

29. Regarding claim 4, the combined invention of Gonzales, Simon and Park discloses all limitations of its parent, claim 1. Gonzales also discloses different layers (i.e., granularity, including frame-, macroblock- and block-level-)) in video encoding [Col. 2, line 47-Col. 3, line 31].

Additionally, Lee discloses filtering at different granularity [Fig. 3, refs. 350 (bit rate adaptive median filter), 395 & 392; the last 5 lines of paragraph 44; note that given alternatives, selectability is inherent].

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combined invention of Gonzales, Simon and Park with the teachings of Lee as recited above to obtain the invention as specified in claim 4. The reason for doing so would have been to change the bit rate (by adapting the filter) only as frequent as needed so as to reduce processing overhead.

30. Claim 39 is similarly analyzed and rejected as per the analysis of claim 4 and parent claim 32.

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31. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gonzales et al. (US 5,231,484), Simon et al. (US 7,184,578) and Park et al. (US 6,353,632) as applied to claims 1-3, 5, 7, 8, 11, 13, 15, 16, 18-22, 24-30, 32, 34-36, 40, 41 and 43 above, and further in view of Duda et al. (Pattern Classification and Scene Analysis, 1973; pp. 130-134).

32. Regarding claim 6, the combined invention of Gonzales, Simon and Park discloses all limitations of its parent, claim 5.

Additionally, Duda discloses a decision process (using linear discriminant functions) that uses a plurality of weighting factors for some attributes (i.e., criteria) [pp. 130-134, especially equations 1 and 2; note that X can be considered as a criteria vector and w the weight vector; note further that the dynamic adaptation can be considered as a decision process].

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combined invention of Gonzales, Simon and Park with the teachings of Duda as recited above to obtain the invention as specified in claim 6. The reason for doing so would have been because linear discriminant functions possess a variety of pleasant properties as Duda recites in the 2nd paragraph on page 130.

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33. Claims 12 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gonzales et al. (US 5,231,484), Simon et al. (US 7,184,578) and Park et al. (US 6,353,632) as applied to claims 1-3, 5, 7, 8, 11, 13, 15, 16, 18-22, 24-30, 32, 34-36, 40, 41 and 43 above, and further in view of Masukura et al. (US 2003/0001964):

34. Regarding claim 12, the combined invention of Gonzales, Simon and Park discloses all limitations of its parent, claim 1, but does not expressly disclose the following, which is taught by Masukura:

- sharing at least some data between filtering processes respectively associated with multiple unique output video streams that are generated from a single input video stream during a single encoding session
  [Fig. 7, refs. 702 (format conversions of the same input, considered as filtering processes), 704 (produces shared data); paragraphs 84 & 85 (see also paragraph 44, in which control data from ref. 104 are shared data)]

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combined invention of Gonzales, Simon and Park with the teachings of Masukura by sharing data between filtering processes to obtain the invention as specified in claim 12. The reason for doing so would have been to apply the instructions of the user to the processes, as indicated in paragraph 44 of Masukura.

35. Claim 38 is rejected per the analysis of its parent claim 32, the disclosure of Masukura [Fig. 7, refs. 701-704 (transcoders)], as well as official notice that a motion picture typically includes both audio and video components and it is well known for a processing apparatus to also include an audio processing component, in addition to a video one in order to process both components; the use a streaming server for the distribution of audio-video data is also well known in the art.

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36. Claims 14, 23 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gonzales et al. (US 5,231,484), Simon et al. (US 7,184,578) and Park et al. (US

6,353,632) as applied to claims 1-3, 5, 7, 8, 11, 13, 15, 16, 18-22, 24-30, 32, 34-36, 40, 41 and 43 above, and further in view of Gomila et al. (US 2003/0206664).

Regarding claim 14, and similarly claims 23 and 33, the combined invention of Gonzales, Simon and Park discloses all limitations of its parent, claim 13, but does not expressly disclose the following, which is taught by Gomila:

- wherein adaptively changing the characteristic of the filtering includes reducing strength of the filtering as a human visual system adjusts to the image changes
  [Paragraph 31, especially lines 7-11. Note that the decrease in filter strength is according to human vision]

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combined invention of Gonzales, Simon and Park with the teachings of Gomila by reducing filter strength in the recited manner to obtain the invention as specified in claim 14. The reason for doing so would have been to reduce computation, as Gomila indicates in the last 4 lines of paragraph 31.

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37. Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gonzales et al. (US 5,231,484), Simon et al. (US 7,184,578) and Park et al. (US 6,353,632) as applied to claims 1-3, 5, 7, 8, 11, 13, 15, 16, 18-22, 24-30, 32, 34-36, 40, 41 and 43 above, and further in view of Hiroshige et al. (US 2002/0196335).

Regarding claim 42, the combined invention of Gonzales, Simon and Park discloses all limitations of its parent, claim 32, but does not expressly disclose the following, which is taught by Hiroshige:

- wherein the first filter has a strength that can be changed based on an amount of edge information to be filtered from the video frames
[Figs. 1, 3; paragraphs 62-79]

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combined invention of Gonzales, Simon and Park with the teachings of Hiroshige as recited to obtain the invention as specified in claim 42. The reason for doing so would have been to reduce noise properly, as Hiroshige indicates in paragraph 6.

Allowable Subject Matter

38. Claims 9, 10, 17, 31 and 37 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

39. The following is a statement of reasons for the indication of allowable subject matter:

40. Regarding claim 9, and similarly claims 17 (the level of filtering or smoothing is interpreted as strength), 31 and 37, closest art of record, alone or in combination, does

not disclose, teach or suggest determining whether to increase strength of the filtering based on whether a difference between old and new filter strengths is within a range.

Conclusion and Contact Information

41. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- Srinivasan (US 2005/0013359) - discloses switching (i.e., selectable) filtering based on quality [Fig. 7]
- Holcomb et al. (US 7,266,149) discloses selecting transforms sizes at different granularity [Col. 6, lines 24-26]
- Lee et al. (US 2002/0165844) – discloses a decision process that combines weighted attributes [Fig. 5]

42. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yubin Hung whose telephone number is (571) 272-7451. The examiner can normally be reached on 7:30 - 4:00. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew C. Bella can be reached on (571) 272-7778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

43. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Yubin Hung
Patent Examiner
Art Unit 2624

December 10, 2007